Amendments to the Claims:

18. (Cancelled) Filtration apparatus comprising:

a filter housing having a filtration fluid inlet, a filtration fluid outlet, and a filter bed disposed therebetween;

compressible filtration media disposed in said filter bed;

means for establishing a filtration fluid flow direction through said filter bed in said filter housing, from said inlet to said outlet, for filtration of suspended particles from the fluid and for cleaning of said media;

actuating means for adjustably compressing said filtration media from an expanded condition during cleaning to a variably compressed condition during filtration, said means compressing said media and establishing a plurality of layers of said media in said filter bed progressively more compressed in the flow direction for removal in the flow direction of progressively smaller suspended particles, said compressing means varying compression during filtration to vary the porosity and collector size of said filter media for adjustment of headloss across said filter bed and suspended particle removal efficiency; and

means for cleaning said filtration media in an expanded condition by flowing fluid for cleaning over said media in said filtration fluid flow direction, said means including an outlet for cleaning fluid separate from said filtration fluid outlet and located opposite said filter bed from said fluid inlet.

19. (Cancelled) Apparatus of Claim 18 wherein said filtration apparatus comprises multiple of said filter housings, each an independently operated cell whereby the filtration media in selected cells is expanded for cleaning, while in others it is compressed for filtration.

20. (Cancelled) Apparatus of Claim 18 wherein said filtration media is a plurality of individual and substantially spherical crimpy fibrous lumps having a specific gravity higher than that of water.

21. (Cancelled) Apparatus of Claim 18 further comprising means for shearing entrapped particles from expanded media.

22. (Cancelled) Apparatus of Claim 21 wherein said shearing means comprises means for distributing air into said filter media in the filtration fluid flow direction.

23. (Cancelled) Apparatus of Claim 18 wherein said means for compressing said filtration media comprises:

a first perforated panel immovably mounted within said apparatus and defining one end of said filter bed;

a second perforated panel movably mounted within said apparatus and spaced from said first perforated panel to define an opposite end of said filter bed; and

means for selectively moving said movably mounted second perforated panel toward and away from said first perforated panel.

24. (Cancelled) Apparatus of Claim 18 wherein said means for compressing said filtration media comprises:

a first perforated panel immovably mounted within said apparatus and defining one end of said filter bed;

a second perforated panel movably mounted within said apparatus and spaced above said first perforated panel to define an opposite end of said filter bed; and

means for selectively moving said movably mounted second perforated panel toward and away from said first perforated panel, said means being located above said second perforated panel, wherein said fluid inlet is disposed below said fluid outlet and said apparatus is an up-flow, mono-media, deep-bed filter.

25. (Cancelled) Apparatus of Claim 18 wherein said filter bed has a porosity of about 92 to 94% prior to compression and a porosity of from about 87 to 90% when compressed.

26. (Cancelled) Apparatus of Claim 18 wherein said filter bed prior to compression has a depth of at least about 30 inches (760 mm).

27. (Cancelled) Apparatus of Claim 18 wherein said apparatus is operable for filtration at a fluid flow rate of from about 205 to 1230 L/m2°min (5 to 30 gal/ft2°min), at a bed compression ratio of from about 0 to 40 percent, and at a backwash rate of from about 1 to 6 percent based on the total fluid passing through the filter.

28. (Cancelled) Apparatus of Claim 27 wherein said fluid flow rate is from about 410 to 1230 L/m2°min (10 to 30 gal/ft2°min).

29. (Cancelled) Apparatus of Claim 27 wherein said fluid flow rate is from about 820 to 1230 L/m2°min (20 to 30 gal/ft2°min).

30. (Cancelled) Apparatus of Claim 18 wherein said inlet is below said outlet and said apparatus operates upflow.

31. (Cancelled) Upflow filtration apparatus comprising:

a filter housing having a fluid inlet and a fluid outlet, wherein said fluid inlet is disposed below said fluid outlet;

a first perforated panel immovably mounted within said apparatus to receive fluid from said inlet;

a second perforated panel movably mounted within said apparatus and spaced above said first perforated panel to discharge filtered fluid to said outlet and defining a filter bed with said first perforated panel;

filtration media comprising a plurality of individual, substantially spherical, compressible, synthetic fibrous lumps disposed in said filter bed within said filter housing and between said first and second perforated panels; and

means for selectively moving said movably mounted second perforated panel toward and away from said first perforated panel, said means being located above said second perforated panel, whereby said bed is expanded for cleaning and whereby the porosity and collector size of said filter media can be adjusted during filtration by adjusting compression of said media.

32. (Cancelled) The apparatus of Claim 31 further comprising means for introducing a gas into said filtration fluid for cleaning said media when said filter bed is expanded for cleaning.

33. (Cancelled) The apparatus of Claim 31 further comprising a plenum for evenly distributing the filtration fluid through said first perforated panel.

34. (Cancelled) The apparatus of Claim 31 wherein said filtration media comprises poly vinylidene chloride.

35. (Cancelled) The apparatus of Claim 31 wherein the porosity of said filter bed prior to compression is from about 92 to 94% and after compression is from about 87 to 90%.

36. (Cancelled) Apparatus of Claim 31 wherein said apparatus is operable for filtration at a fluid flow rate of from about 820 to 1230 L/m2°min (20 to 30 gal/ft2°min), at a bed compression ratio of from about 15 to 40 percent, and at a backwash rate of from about 1 to 6 percent based on the total fluid passing through the filter.

37. (Cancelled) Apparatus of Claim 31 wherein said apparatus is operable for filtration to reduce the turbidity of influent wastewater from about 8 NTU to about 2 NTU at a wastewater flow rate of from about 820 to 1230 L/m2°min (20 to 30 gal/ft2°min), at a bed compression ratio of from about 15 to 40 percent, and at a backwash rate of from about 1 to 6 percent based on the total wastewater passing through the filter.

38. (Cancelled) Apparatus of Claim 37 wherein the backwash flow rate is from about 1 to 3 percent based on the total wastewater passing through the filter.

39. (Cancelled) Apparatus of Claim 18 wherein said filtration apparatus comprises multiple of said filter housings, each an independently operated cell whereby the filtration media in selected cells is expanded for cleaning, while in others it is compressed for filtration.

40. (Cancelled) Upflow filtration apparatus comprising:
a filter housing having an influent conduit for introducing unfiltered fluid to the apparatus, an effluent conduit for filtered fluid, and a backwash effluent conduit for cleaning, and wherein said influent conduit is located below said effluent conduits;

a first perforated panel immovably mounted within said apparatus to receive fluid from said influent conduit;

a second perforated panel movably mounted within said apparatus and spaced above said first perforated panel for discharging fluid to one of said effluent and recycle conduits, said first and second panels defining a filter bed within said apparatus and each said panel having a plurality of fluid passage apertures therein;

filtration media comprising a plurality of individual, substantially spherical, compressible crimpy fibrous lumps of synthetic polymer disposed in said filter bed within said filter housing and between said first and second perforated panels;

a piston located above said second panel and connected to said second panel for adjustably moving said second perforated panel toward and away from said first perforated panel to compress or expand said filtration media, whereby said filtration media is expanded for cleaning and compressed to establish a-plurality of layers of said media in said filter bed progressively more compressed from said first panel to said second panel for removal of progressively smaller suspended particles in the flow direction, said piston varying compression during filtration to vary the porosity and collector size of said filter media for adjustment of headloss across said filter bed and suspended particle removal efficiency; and

wherein said effluent conduit receives filtered fluid while said media are compressed and said backwash conduit receives unfiltered fluid from cleaning said filtration media while expanded.

41. (Cancelled) Filtration apparatus of Claim 40 further comprising a source for unfiltered water and wherein said backwash effluent conduit is in flow connection with said source for returning said backwash effluent to said source.

42. (Cancelled) Filtration apparatus of Claim 40 wherein said backwash conduit is connected to a drain.

43. (Cancelled) Filtration apparatus of Claim 40 further comprising a turbidity monitor for monitoring suspended particle removal.

44. (Cancelled) Filtration apparatus of Claim 40 further comprising at least one conduit disposed below said first panel for distributing a gas into said expanded filter bed for removing entrapped suspended particles from said filter media.

45. (Cancelled) Filtration apparatus of Claim 40 further comprising multiple cells of filter housings each having independently operable influent, effluent, and backwash conduits wherein one or more cells can be operated in an expanded filtration media mode for cleaning independently of other cells.

46. (New) High rate filtration apparatus for removing suspended solids from liquids, said apparatus comprising:

a) a filter housing having an axial flow direction therethrough for liquid;

b) a first perforated panel fixedly secured in said housing transverse to said flow direction;

c) a second perforated panel movably secured in said housing transverse to said flow direction and spaced from said first perforated panel;

d) an influent liquid conduit located adjacent said fixed first panel;

e) an effluent liquid conduit located adjacent said movable second panel thereby establishing said axial flow direction through said housing from said influent conduit to said effluent conduit;

f) substantially spherical and compressible filtration media of individual, fibrous lumps of bundled, crimped fibers located between said first and second panels; and

g) a piston for moving said second perforated panel toward and away from said fixed first panel to define:

i) a fixed filter bed of said media compressed between said panels during filtration, said filter bed having a porosity gradient across the bed proceeding progressively from more porous to less porous in said axial flow direction; and

ii) a cleaning chamber between said panels during washing wherein said second panel is moved away from said first panel to provide said media in an uncompressed condition for washing in said axial flow direction.

47. (New) The high rate filtration apparatus of Claim 46 further comprising pressure sensing apparatus for monitoring head loss.

48. (New) The high rate filtration apparatus of Claim 46 wherein said effluent liquid conduit comprises a filtered liquid effluent conduit and a separate wash water effluent conduit.

49. (New) The high rate filtration apparatus of Claim 46 further comprising a distribution plenum located between said liquid influent conduit and said fixed first perforated panel, whereby liquid is evenly distributed through said first panel and into said filter bed.

50. (New) The high rate filtration apparatus of Claim 46 wherein said axial flow direction is upflow, said fixed first panel is located below said movable second panel, said influent liquid conduit is

located below said fixed first panel, and said effluent liquid conduit is located above said movable second panel.

51. (New) The high rate filtration apparatus of Claim 50 further comprising a gas injection conduit located adjacent said first panel for supplying air to mechanically shear trapped solids from said media in said cleaning chamber.

52. (New) The high rate filtration apparatus of Claim 51 wherein said gas injection conduit comprises two air conduits whereby air injection is alternated between said two conduits to increase the mechanical effect of shearing trapped solids from said media.

53. (New) The high rate filtration apparatus of Claim 46 wherein said influent conduit is in flow communication with a single source of liquid for said fixed filter bed and said cleaning chamber.

54. (New) The high rate filtration apparatus of Claim 46 wherein said influent conduit is in flow communication with a single source of liquid for said filter bed at a flow rate of about 820 to 2050 L/m2°min (20 to 50 gal/ft2°min) at a bed compression ratio of from about 15 to 40 percent, and wherein said influent conduit is in flow communication with a single source of liquid for said cleaning chamber at a rate of from about 1 to 6 percent based on the total fluid passing through the filter.

55. (New) The high rate filtration apparatus of Claim 46 wherein collector size, effective pore size, and depth of said filter bed are adjustable by movement of said second panel as filtration proceeds, whereby head loss can be adjusted and filtration efficiency maintained during filtration by mechanically expanding said fixed bed.

56. (New) The high rate filtration apparatus of Claim 46 further comprising multiple cells of filter housings each having independently operable influent and effluent conduits wherein one or more cells can be defined as cleaning chambers independently of other cells defined as filter beds.

57. (New) Up-flow high rate filtration apparatus for removing suspended solids from waste water, said apparatus comprising:

a) a vertically oriented filter housing having a waste water influent conduit located in a lower portion thereof and separate filtered water and wash water effluent conduits located in an upper portion thereof, said conduits establishing an upward axial flow direction through said housing;

b) a first perforated panel fixedly secured in said housing above said influent waste water conduit and transverse to said axial flow direction;

c) a second perforated panel movably secured in said housing transverse to said axial flow direction, above said first panel and spaced therefrom, and below said filtered water and wash water effluent conduits;

d) a distribution plenum located between said influent waste water conduit and said fixed first perforated panel, whereby waste water is evenly distributed through said first panel in said axial flow direction;

e) substantially spherical and compressible filtration media of individual, fibrous lumps of bundled, crimped fibers located between said first and second panels;

g) a piston for moving said second perforated panel toward and away from said fixed first panel to define:

i) a fixed filter bed of media compressed between said panels at a bed compression ratio of from about 15 to 40 percent during filtration, said fixed filter bed having a porosity gradient across the bed proceeding progressively from more porous to less porous in said axial flow direction, wherein collector size, effective pore size, and and depth of said filter bed are adjustable by movement of said second panel as filtration proceeds at a flow rate of about 820 to 2050 L/m2°min (20 to 50 gal/ft2°min), and whereby head loss can be adjusted and filtration efficiency maintained during filtration by mechanically expanding said fixed bed; and

ii) a cleaning chamber between said panels during washing wherein said second panel is moved away from said first panel to provide said media in an uncompressed condition for washing at a rate of from about 1 to 6 percent based on the total fluid passing through the filter; and

h) a pair of air conduits located below said fixed first panel on opposite sides of said housing whereby air injection is alternated between said conduits into said cleaning chamber to increase the mechanical effect of shearing trapped solids from said media.

58. (New) An activated sludge plant for the biological treatment of waste water, said plant comprising:

a) an activated sludge reactor for digestion by a biological sludge of carbonaceous organic compounds in influent waste water;

b) a clarifier in flow receiving communicaiton with said reactor for receiving a mixture of sludge and waste water from said reactor and separating the sludge from the wastewater; and

c) a depth, monomedia, high filtration rate, low-volume wash water, upflow filter in flow receiving communication with said clarifier for receiving clarified waste water from said clarifier and removing suspended particles from said waste water to provide a treated waste water effluent from said plant, said monomedia low-volume wash water upflow filter comprising:

i) a vertically oriented filter housing having conduits for clarifed waste water influent, treated waste water effluent, and washing water effluent, said washing water effluent conduit in flow delivering communication with said activated sludge reactor for recycling wash water to said reactor;

ii) substantially spherical and compressible filtration media of individual, fibrous lumps of bundled, crimped fibers located in said filter housing for receiving influent and providing effluent;

iii) a first perforated panel fixedly secured in said housing and defining a lower retainer for said filtration media;

iv) a second perforated panel movably secured in said housing and spaced from said first perforated panel to define an upper retainer for said filtration media; and

v) a piston for moving said second perforated panel toward and away from said fixed first panel to compress said media during filtration between said panels at a bed compression ratio of from about 15 to 40 percent, said filtration media having a porosity gradient across the bed proceeding progressively upflow from more porous to less porous, wherein collector size, effective pore size, and and depth of said filtration media are adjustable by movement of said second panel to mechanically expand said fixed bed as filtration proceeds at a flow rate of from about 820 to 2050 L/m2°min (20 to 50 gal/ft2°min), whereby head loss can be adjusted and filtration efficiency maintained during filtration, and to provide said filtration media in an uncompressed condition for

washing at a low-volume wash water rate of from about 1 to 6 percent based on the total fluid passing through the filter.

59. (New) The activated sludge plant of Claim 58 further comprising a pair of air conduits located on opposite sides of said housing to inject washing air into said filtration media in an uncompressed condition whereby air injection is alternated between said conduits to increase the mechanical effect of shearing trapped solids from said media.

60. (New) The activated sludge plant of Claim 58 wherein said filter comprises multiple filter housings each having independently operable influent and effluent conduits and movable second panels wherein filtration media in one or more filter housings can be washed independently of other filter housings.